

CRM through DM: a case study

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Abstract

A great dilemma that has been coming on and on along time is the data confront and information concepts. It is also true that this confront, in 15 or 20 years ago, was nothing else but pure philosophical thinking, because the market as a whole didn't have the dimensions neither the technology that were presented in the beginning of this century.

A new time that has come, with the new globalized economy, will be the century of the competence and excellence of the institutions' administrator. Only the companies that know how to work with the correct information will manage the work successfully in full competitive market.

We can extract information in abundance from existing day by day data, using a set of techniques that are important and of extreme value in several research areas denominated Data Mining (DM).

Our goal here is to get to know better customer and to take competitive advantage in the market, through the combination of knowledge extraction and the concept of Customer Relationship Management (CRM).

DM assisting CRM, will provide a series of inferences that one sole technique would not allow us to observe: seek customer's retention, avoid churn, making loyalty a customer's commitment.

1 Introduction

Countless are the literary works that make allusion to the new economic and politics order imposed by several countries in the last decade of XX century. The truth is that companies of several segments, mostly of the services' one, found themselves obliged to modify their way to deliver their services to the new customer that arose from the globalized economy impact.

The new customer turned to be extremely demanding, because many products and a lot of services, in the world, come to their door offering true marvels that will allow their lives to be simpler and easier.

The new customer, the globalized one, is getting used to have his needs and satisfaction quickly satisfied and with quality. In a short time he got accustomed to have quality and efficiency, which are day by day expected with fervor.

The necessity to dispute for consumer and maintain him faithful to their brand/product made the companies review their concepts, oriented almost exclusively to their product and/or brand in the in the past they are now turning their eyes more attentively to the consumers. Never, concepts such as CRM (Customer Relationship Management), customers' retention rates (customers' loyalty), database marketing analysis, data mining and segmentation were so in vogue as nowadays

We can understand CRM as a set of quantitative and qualitative management strategies - "innovative strategies"- used to obtain benefits and competitive advantages generating greater profits and providing great customers' retention rate. The market's evolution leads to marketing techniques evolution.

Customer's real wishes are a vision to marketing executives, as usually the companies develop products not exactly according to customer's actual wishes. as each day passes by we verify that a great number of advertising goes to trash – the customer's mailbox. Altogether the reactions against promotional calls are increasingly growing too inconvenient. And the worst, the annual investment in those kinds of actions goes down the drain.

The model "how to get a furious customer" is common in the direct marketing are now done through e-mail. Many of the online groups created are not consolidated as interest communities or discussion groups. For that reason, our intention in the present paper is to investigate, through academic publications and other international indexed papers, the CRM's systems, its pros and cons. Some available international software in the market was used to get to some conclusions about churn analysis.

2 Customer Relationship Management (CRM)

However worldwide used, the expression CRM was never formally defined. For this reason, many suppliers are following the market action in this direction. They call out their CRM's applications (the same that are already in use from a long time ago). We can say that CRM is an infrastructure to implement the philosophy one-to-one relationship with customers. According to Gartner Group, "CRM is a strategy aiming at understanding and anticipating current customers' needs and company's potentials to fulfill them".

From the technological point of view, CRM involves capturing customer's data in the whole company and along time, consolidating all of the internal existing data in a central database. Then, analyzing the consolidated data, distributing the results of this analysis to the several contact points with customer and finally using that information to interact with customer from any point in the company.

The traditional systems are generally conceived based on process or product where customer is merely a bad necessity. In the systems and processes that are conceived under CRM's light, customer is the main object, and all the reports and consultations see customer as an entrance door.

There is a focus migration tendency from on products to on customers. More and more companies are now organizing themselves in function of the several kinds of customers they have. That organization allows customers' differentiation first by the different several customers they have and afterwards for each individual's needs. The best way to witness that change is to visit websites companies in the Internet. We verify that they are changing their menus from products' orientation to customer's type and/or needs orientation. That facilitates in such way the access of information and pertinent offers to the needs of customers and also facilitates the company learning regarding the needs to this customers (e.g. Amazon.com)

From the point of view of systems, CRM is the integration among sales automation modules, sales management, telemarketing, customer assistance and support service, marketing automation, management information, Web and e-commerce.

It can not be forgotten that integration of all those applications with ERP's systems or with the transactions' systems, called "back office" systems.

The growth and quality, and revenue, are the organizations' goals and, because of this CRM is nowadays more important than ever. It must be incorporated to the organization vision.

We can conclude that CRM has to do with the capture, processing, data analysis and distribution of data, with total concerning towards the customer that will allow the company to sell more products/services and offer it more efficiently.

3 CRM's Strategy

According to Rogers and Peppers [1], there are four CRM's basic strategies: identify customers, differentiate customers, interact with customers and personalize the relationship.

3.1 Identify

In order to begin a relationship based on one-to-one marketing with your customers, it is initially necessary to identify each one. In other words, get to know their identity, preferred contact form, all the transactions you had with them and interactions accomplished with the company, all the complaints and what solutions were proposed, knowing each customer and your history, on individual basis. The relationship one-to-one is not targeted to all of your customers, however without identifying each one it is impossible to know the ones who must receive this differentiated treatment are.

3.2 Differentiate

Soon after the identification, it is fundamental to differentiate customers to know to who it is worth developing a learning relationship with.

Customers' differentiation step goal is identifying the most valued customers to the company and their potentiality.

When we talk about value, we must always have in mind the Lifetime Value (LTV), which is the value that customer has through all his transactional history with the company, the references that he did and that were transformed into sales, among others. It always expresses value in terms of profitability. Therefore, the revenue, besides being one of the most used metric; it is not the most adequate. We must also measure how much it is attending each customer, by the simple fact that costs are different from customer to customer.

Another kind of value, less tangible, is called strategic value. It is not measurement, but interpretation. Customers that collaborate with the company with complaints, suggestions are used as reference, for example, the one who have a sense of value more accurate than others who are passive ones. Besides being difficult, that value must be interpreted and stored in customers' database. When interpreted, the strategic value tends to be refined throughout time, leading to learning more about customers.

It is time now to know how to treat customers that are expensive to the company and there is no profitability for the company for working with them. Those customers are also called "below zeros". They must be charged the real service's price and their names taken out of your promotional mailing list and out of other contact initiatives, without, however, to eliminate from your database file. In resume, sell to them but charging the current price for the product/service.

3.3 Interact

After finding customers of larger potential, the next step is to provoke them to interact with company. The interaction is the only way to get to know customers better each time. The final goal is to develop a learning relationship, where more and more services and products are customized for customer that will find it convenient to continue faithful to the company. There is an intimate relationship between interaction and the differentiation. In fact those two strategies are side by side, because one depends on the other.

3.4 Personalize

From the knowledge of customers' needs, the company must customize services and products to make the experience of doing business with the company unique. The more customized, more value will be delivered to the customer, who will find it convenient to continue with the company.

Creating a customization and feedback cycle will allow understanding customer, each time they interact, fulfill his expectations and in the way that he

expects. The message and the relationship must be through the preferred form chosen by customer. Customization is something very simple when we know customer's needs and preferences, but it demands company flexibility and adequate training to get in contact with customer. People must be prepared to adequate their responses according to each customer's characteristics.

4 Customer Retention

In a research held in 1987 by "The Forum Group" - an American consulting company specialized in administration - employees of American and Canadian companies affirmed that acquiring customers was considered a priority in their work, twice more important than to retain the ones that were already dealing with. That can be a big mistake.

Kotler & Armstrong [2], recommend a special attention to customer's churn. Customer's churn brings great expenses to the organizations, and they demand measurement to reduce the rate.

The reason for customer's churn must be investigated, trying to correct the directions in order to stop customers' evasion. There is nothing to do with customers that were changed, however customers that stopped buying from the company for reasons of dissatisfaction are recoverable, since problems can be solved through conversation.

An aggressive marketing costs more than a defensive one, because it demands an enormous investment maintain customers away from competitors and gain satisfied customers for the company (Kotler & Armstrong, ib.).

According to McKenna [3], "Retain customers are a great way to grow. Studies show that the price to acquire new customers is five times larger than the cost to retain old customers".

It is of great importance to follow closely current customers. The longer is the relationship with customer, the better. Consulting Bain & CO. data, in Boston, indicates that the profit of 10% from the relationship of one year with a customer can grow up to 60% if it is prolonged for more than seven years.

Customers for many years tend to recommend the organization that serves them, the family and friends well. The world nowadays offers countless options to customers. In the credit cards market, for example, reducing customers' desertion in just 20% means the same, in the final result, as 10% of cutting costs.

Thus, observing the retention process is fundamental and represents an important matter in the company's survival process. The relationship management is a process based on three pillars:

- knowledge - it refers to the quantity of information and richness that is must have from customer (analytic-CRM);
- technology - to obtain and analyze information that allows promptness in the decisions' support (operational-CRM);
- relationship construction - through the effective communication (Collaborative-CRM).

Finally, there is a direct relationship between customer's retention rate and the average of your lifetime value (LTV). To calculate lifetime value of a

customer it is required a cash flow estimate that customer should provide to the company if he reaches fidelity average level. In other words, if an account lasts an average of ten years, it is necessary to calculate the value of the current net profit of this customer for more than ten year. This way, it is possible to calculate the impact of that customers' retention rate would have on the company's profitability and also the increase effect of a customer's lifetime. This information is certain base for decision-making of marketing investment. The mathematical function, eqn. (1), below illustrates the relationship between retention rate and customer's lifetime [4].

$$LTV = \frac{1}{1 - \text{retention rate}} \quad (1)$$

5 Data Mining

The activity "knowledge discovery" is one of the most fascinating techniques, where learning machine algorithms and pattern recognition ran. Most data mining methods are based on learning machine concepts, recognition pattern, statistics, classification, segmentation, and graphic models.

The result of knowledge discovery process can be shown in a several ways. However, these forms must provide criteria analysis to identify the necessity to go back to any of the previous steps of KDD process.

This presentation suggests that there is a linear way of the KDD process. In fact, this is not generally detected, as in each step it may identify the necessity to go back to any of the previous ones. For example, if in the codification activity or even in the data mining one, it is identified that the data is not so consistent, or that there is a necessity of a new specific data that was not planned previously, that can lead us to the consistency phase or even to the data selection one.

6 Conflict Analysis

As we told before, for the relationship marketing concepts, fidelization and desertion analysis (churn) be in fact implemented, it will need advanced techniques for database studies and inferences [5] depending on the problem.

The date mining comes to make the analysts' database marketing aspiration [6] real enabling precise and great analyses.

DM extracts hidden predictive information from huge database [7]. It is a powerful technology that gathers a great potential for the definition of future market information.

DM's techniques can be implemented quickly using software and hardware [5], as assistants. When implemented in high performance platforms client-server or worked with processing parallel computers, DM's instruments can analyze given robust databases answering, for example: which customers tend to answer positively to the next promotional campaign? Which customers have the habit of changing products constantly or tend not to buy company's products anymore?

In the present study, will be presented a case study for customer dataset (5000 customers), of a North-American mobile telephone company. In fact, it is presented a benchmarking study between two renowned softwares in the international market: Enterprise Miner from SAS Institute, and Mine Set from SGI.

Both softwares present excellent graphic solution for the user, and no necessity of profound programming knowledge. In fact, two comparisons will be presented. The first technique with had better performance for churn analysis in the EM was: neural network and the tree decision. In the second case, the comparison between both mentioned softwares, concerning the tree decision technique. A third technique, regression analysis, was also used with EM being weaker regarding solution analysis. The neural network presented a little mistake regarding tree decision in both softwares. Their results will be presented as example altogether to be internalized by data miners who make use of several techniques for the problem solution.

To say the truth, our intention is not to precisely define what churn means. Churn was presented in a series of companies that have, mostly, a constant and/or periodic dependence of their customers. So, we could mention the Telcos (fixed and wireless), CABLE TV companies, credit card ones and many other that depend on service for their survival.

Wireless' market of Telco projects for 2004 a market of 200 million of customers. From this total approximately 3/4 of customers will promote churn between operators. The American market modified their churn rates forecast from 30% to 40 % for 2004.

Although they are worried about the churn, it is inevitable. It will be necessary for administrators and/or managers a specialization. The future of many service companies will be through churn's correct administration. Get to know how to avoid churn and, at the same time, prospect unsatisfied customers in the market will be a great challenge.

According to Mattison [8] the ones who know how to explore and analyze churn will have a market of some billions of dollars in their hands (e.g. Telcos). Churn analysis will help to know better your company. Churn analysis helps understanding customers and their wishes.

7 Case

A comparative study was held between both softwares, including the comparison of techniques that best performed regarding problem solution and inferences.

We used the same data cleaning procedures for both softwares. It was detected that MS presented better solution in the tree decision technique.

To resume, Mine Set worked (mined) better the dataset tree decision technique. Among techniques used in Enterprise Miner, we had, in precision order: tree decision, neural network and the linear regression, respectively.

Some graphic considerations are interesting to present regarding Enterprise Miner. We will present the graphic two comparisons among techniques at a time, for visual aspects only.

Figure 1 presents a comparison among linear regression and artificial neural network techniques. In figure 2 we have the comparison between decision and linear regression tree and, finally, in figure 3 we have the comparison between tree decision and neural network approaches. As one can see the tree decision technique and neural network (figure3) presented the two best solutions with response rate above 90% for the first decil (approximately 95%). The type of the neural network was backpropagation multiperceptron. Their learning rates (LR) and momentum were stipulated, empirically, in 0,25 and 0,90 respectively.

A brief analysis verifies that the baseline automatically generated by EM, represented 15 % of the data. This implies that if I had had a promotional catalog, for example, 90 % of my 10% best buying customers would answer positively to the promotion.

In the regression case, for the first decil, we would have a forecast response of 50%, for the 10 % best buying customers.

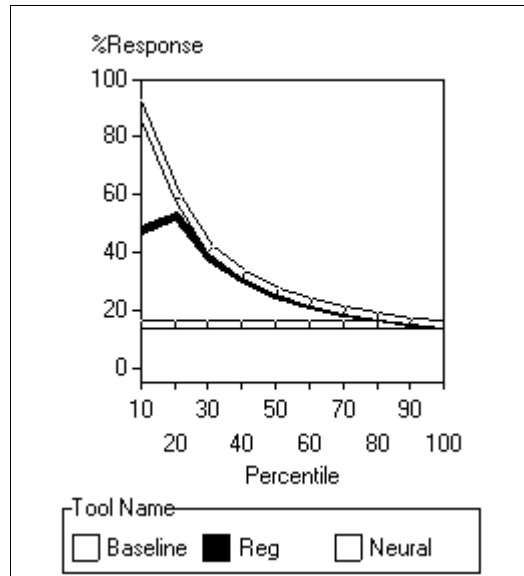


Figure 1

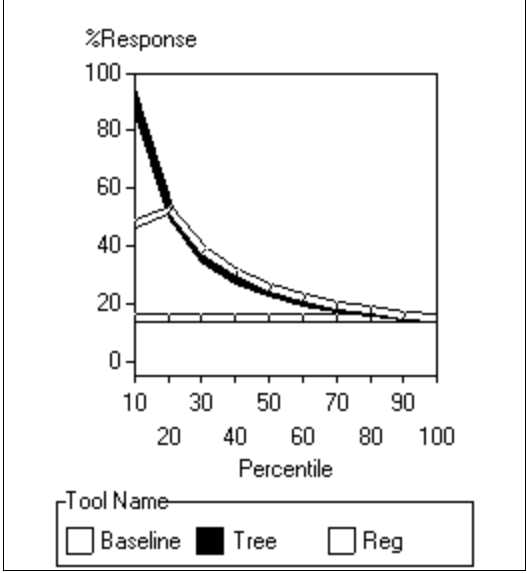


Figure 2

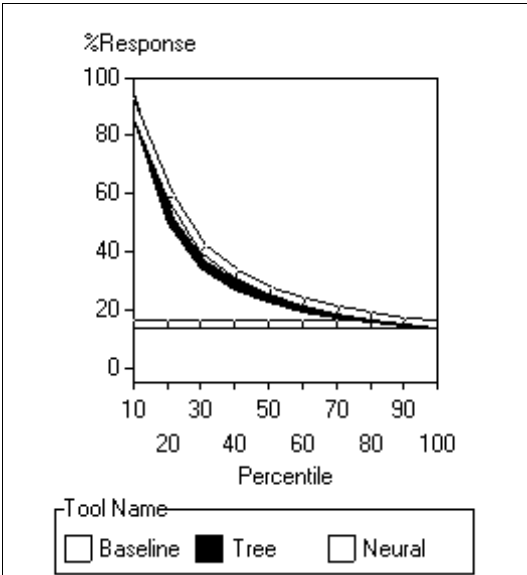


Figure 3

8 Conclusions

This study shows out that CRM comes to attend globalized economy's needs, where everybody possesses everything he wants. The difference is how several services or manufactured companies will fulfill the most demanding customers' needs concerning delivery time, customized relationship and quality of product.

However, CRM cannot be applied for all of customers but for the most profitable for the company. Customers who are not the most profitable for the company will have massive marketing treatment.

CRM is the integration among sales automation modules, sales management, telemarketing, customers' assistance and support service, automation marketing, management information, Web and e-commerce. All of them aiming at a sole common target that is: the customer.

CRM is a set of quantitative and qualitative management- "innovative strategies"- used to obtain benefits and competitive advantages generating larger profits and acquiring greater customers' retention rates.

To carry this out it is necessary to make good use of several techniques and softwares to evaluate the market correctly and customer's opinion. Therefore, data mining techniques and the several softwares that implements these techniques, comes to help CRM and customers' retention, avoiding, this way, churn.

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